

WHAT IS CLAIMED IS:

1. A lithographic projection apparatus that projects a pattern on a wafer by a projection beam by preliminarily determining locations of surface points of a surface profile of the wafer on a stage and subsequently introducing the stage with the wafer into the projection beam; said apparatus comprising:

a projection station that projects a pattern on the wafer arranged on the stage by the projection beam incident in an incidence direction; and

a first measuring station and a second measuring station that are arranged oppositely with respect to said projection station and each serve to measure a height of a wafer and a height of a reference plane of the stage, said first measuring station including a first wafer height sensor and a first stage height sensor, said second measuring station including a second wafer height sensor and a second stage height sensor, said first wafer height sensor and said second wafer height sensor each serving to measure the height of a wafer in said incidence direction, said first stage height sensor and said second stage height sensor emitting light generally towards said projection station and thereby measuring the height of the stage.

2. The lithographic projection apparatus of claim 1 further comprising a control unit that controls said projection station according to the height of the wafer and the height of the stage measured in said first measuring station and said second measuring station.

3. The lithographic projection apparatus of claim 1 further comprising a transporter that transports the stage with the wafer placed thereon perpendicularly to said incidence direction between said first measuring station and said projection station and between said second measuring station and said projection station.

4. A lithographic projection method comprising the steps of:

providing a projection station with apparatus for projecting a pattern on a wafer arranged on a stage by a projection beam incident in an incidence direction and a pair of measuring stations consisting of a first measuring station and a second measuring station, said first measuring station including a first wafer height sensor and a first stage height sensor, said second measuring station including a second wafer height sensor;

introducing into said first measuring station a first stage carrying a first wafer thereon, measuring a height of said first wafer in said incidence direction with said first wafer height sensor, and measuring a height of a reference plane of said first stage with said first stage height sensor by emitting light in a direction perpendicular to said incidence direction toward said reference plane of said first stage and also toward said projection station;

thereafter transporting said first stage with said first wafer thereon into said projection station while continuously measuring the height of the reference plane of said first stage with said first stage height sensor, and projecting said pattern on said first wafer arranged on said first stage by said projection beam incident in said incidence direction;

introducing into said second measuring station a second stage carrying a second wafer thereon, measuring a height of said second wafer in said incidence direction with said second wafer height sensor, and measuring a height of a reference plane of said second stage with said second stage height sensor by emitting light in a direction perpendicular to said incidence direction toward said reference plane of said second stage and also toward said projection station; and

thereafter transporting said first stage with said first wafer thereon out of said projection station, transporting said second stage with said second wafer thereon into said projection station while continuously measuring the height of the reference plane of said second stage with said second stage height sensor, and projecting said pattern on said second wafer arranged on said second stage by said projection beam incident in said incidence direction.

5. A lithography system that projects a pattern on a wafer by a projection beam by preliminarily determining locations of surface points of the wafer on a stage and

subsequently introducing the stage with the wafer into the projection beam, said lithographic system comprising:

- an illumination source;
- an optical system;
- 5 a reticle stage arranged to retain a reticle; and

a working stage including a projection station that projects a pattern from said reticle on the wafer arranged on the stage by the projection beam incident in an incidence direction, and a first measuring station and a second measuring station that are arranged oppositely with respect to said projection station and each serve to measure a height of a wafer and a height of a reference plane of the stage, said first measuring station including a  
10 first wafer height sensor and a first stage height sensor, said second measuring station including a second wafer height sensor and a second stage height sensor, said first wafer height sensor and said second wafer height sensor each serving to measure the height of a wafer in said incidence direction, said first stage height sensor and said second stage height  
15 sensor emitting light generally towards said projection station and thereby measuring the height of the stage.

6. The lithography system of claim 5 further comprising an enclosure that surrounds at least a portion of the working stage, the enclosure having a sealing surface.

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7. An object manufactured with the lithography system of claim 5.

8. A wafer on which an image has been formed by the lithography system of claim 5.

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9. A method for making an object using a lithography process, wherein the lithography process utilizes a lithography system as recited in claim 5.

10. A method for patterning a wafer using a lithography process, wherein the lithography process utilizes a lithography system as recited in claim 5.

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